

Weather System Processor (WSP)

PURPOSE: *The purpose of the Weather Systems Processor (WSP) is to provide low-cost, high-quality, windshear detection equipment at medium-density air traffic airports not equipped with Terminal Doppler Weather Radar (TDWR).*

The WSP provides an accurate, current, and predicted local severe weather picture, which will allow assessment of near-term severe weather impact on terminal area operations. Use of WSP will increase terminal capacity by providing the means of more efficient arrival/departure transition area, terminal area flight route, and runway usage under thunderstorm conditions.

BACKGROUND

The WSP has evolved after 11 years of research by the Massachusetts Institute of Technology/Lincoln Laboratory (MIT/LL) and 8 years of field testing of a proof-of-concept WSP in Huntsville, AL; Kansas City, MO; Orlando, FL; and Albuquerque, NM. The WSP will be installed at 34 Airport Surveillance Radar Model #9 (ASR-9) equipped airports. Graphical and textual products will be delivered to air traffic users and displayed on Ribbon Display Terminals (RDT) and Geographic Situation Displays (GSD). Available products include anomalous propagation (AP) filtered 6-level weather, windshear/microburst detection, gust front and wind shift prediction, storm motion depiction, and Terminal Weather Information for Pilots (TWIP).

ACCOMPLISHMENTS

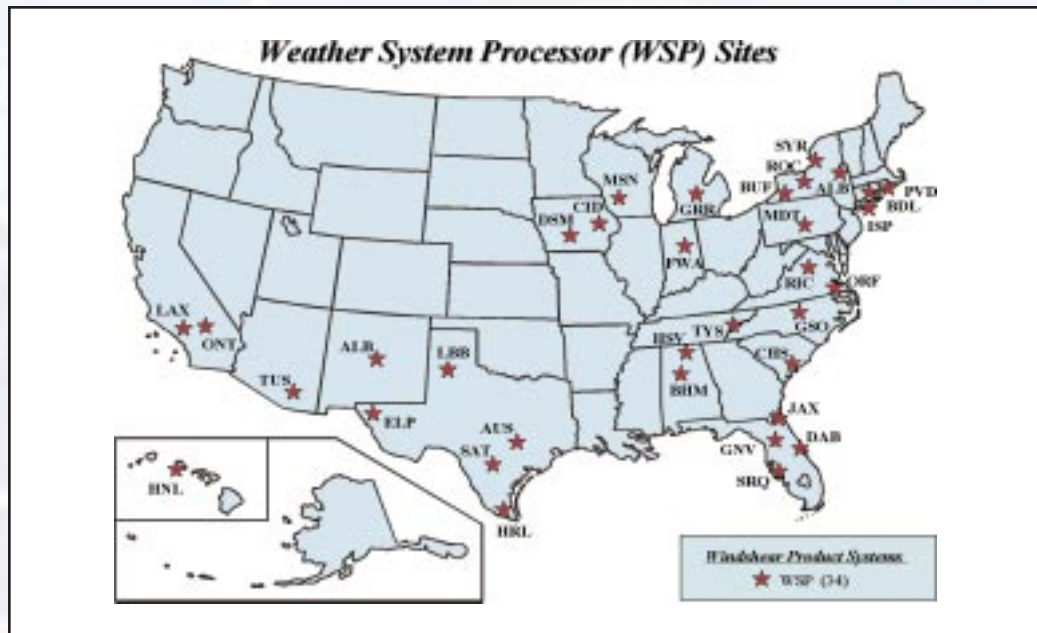
- Proof-of-concept WSP products have been evaluated, operationally, each summer since 1990 using real-time product generation algorithms and user



displays. Demonstrations in Orlando, FL, (1990-1992) side by side with the FAA/LL TDWR proof-of-concept system indicated, from an air traffic controller perspective, nearly identical operational benefits. Subsequent demonstrations in Albuquerque, NM, (1993-present) have further validated the WSP operational product suite.

- ACT-320 has performed two formal evaluations of the WSP proof-of-concept system in Orlando, FL, (1993-1994) has assisted in the installation and is currently monitoring the WSP proof-of-concept testing on the operational ASR-9 in Albuquerque, NM. The results of these demonstrations are published in FAA Technical Notes.
- ACT-320 has installed and tested a WSP waveguide modification to the test bed ASR-9 at the FAA William J. Hughes Technical Center. The results and recommendations are published in Technical Note DOT/FAA/CT-TN98/13.





- ACT-320 participated in two FAA Screening Information Requests (SIRs) that led to a contract being awarded to Northrop Grumman (September 1998) for the development of 34 production WSP systems. It is anticipated that the first limited production system will be delivered to the Technical Center for Test and Evaluation (T&E) in December 1999.

FUTURE WORK

ACT-320 will participate in and provide support to the Windshear Product Team in the following activities:

- WSP Prototype Installation at the new Robert Mueller Municipal Airport in Austin, TX
- Transfer of GFE/GFI Technology to the development contractor
- Conduct Technical Center WSP/ASR-9 test activities:
 - Waveguide modification test and checkout
 - Beam switch test and checkout
 - Technical Center WSP Lab Test Activities
 - Setup and operation of workstation and meteorological test tools
 - Software improvement for viewing live AP corrected 6-level weather
 - Monitoring live WSP products from proof-of-concept system in ABQ

- Update the Test and Evaluation Master Plan (TEMP)
- Monitor contractor development and test activities
- Develop the Operational Test Plan and Test Procedures
- Coordinate WSP Installation at the Technical Center
- Conduct System Test on the WSP Limited Production Systems (scheduled to begin in January 2000)
- Continue Lifecycle Support

For additional information regarding the Weather Systems Processor program, contact:

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